



**DATA-DRIVEN INSIGHTS ON
OLYMPIC SPORTS
PARTICIPATION
AND PERFORMANCE**



IBM NAAN MUDHALVAN

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BONAFIDE CERTIFICATE

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HOD

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ABSTRACT

The Olympic games are international sports events with more than 200 nations participating in various competitions. The Sportspersons from various countries participate in competitions and make their countries proud of their excellence in sports. Despite massive population, many most populous countries fail to grab many medals at the Olympic games. The primary objective of this paper is to analyze the Olympic dataset using python to compare overall performance of countries and to evaluate the contribution of each country in Olympics. These analyses will give deeper insight into the performance of countries in Olympics over the years and helps sportspersons to quickly analyze their own and the competitor's performance. In this paper, the exploratory data analysis techniques are used to provide comparison between performance of various countries and the contribution of each country in Olympics. Visualization of Olympics dataset in many aspects provides the status of countries in Olympics and helps countries with poor performance to produce quality players and improve nation's performance in Olympics.

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LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
DFD	DATA FLOW DIAGRAM
FR	FUNCTIONAL REQUIREMENT
NFR	NON-FUNCTIONAL REQUIREMENT
PS	PROBLEM STATEMENT

CHAPTER - 1

INTRODUCTION

International sporting events, which include summer and winter sports competitions with thousands of athletes from around the world competing in a variety of disciplines, are led by modern Olympic Games or Olympics. The Olympic Games are held every four years, with the Summer and Winter Games alternating by occurring every four years but two years apart. Several changes in the Olympic Games have been made over the course of the 20th century and 21st centuries due to the evolution of the Olympic Movement. Some of these adjustments include the creation of the Winter Olympic Games for snow and ice sports, the Paralympic Games for athletes with a disability, the Youth Olympic Games for athletes aged 14 to 18, the five Continental games (Pan American, African, Asian, European, and Pacific), and the World Games for sports that are not contested in the Olympic games. The International Olympic Committee also endorses the Deaf Olympics and Special Olympics. A range of economies, politics and technological developments has had an impact on the Indian Oil Company. As a result, Olympic Games have shifted away from pure amateurism as proposed by Coubertin in order to allow participation of professional athletes. The question of corporate sponsorship and the commercialization of the Games has been raised in view of the growing importance of mass media. The 1916, 1940 World War had forced the cancellation of this event. and 1944 Games. Participation was limited in the 1980 and 1984 Olympics because of major boycotts brought about by the Cold War. The latter, however, attracted 140 National Olympic Committees, which was a record at the time.

1.1 PROJECT OVERVIEW

International sporting events, which include summer and winter sports competitions with thousands of athletes from around the world competing in a variety of disciplines, are led by modern Olympic Games or Olympics. More than 200 countries are taking part in the Olympics, considered by many to be the world's greatest sporting event. The Olympic Games are held every four years, with the Summer and Winter Games alternating by occurring every four years but two years apart. Several changes in the Olympic Games have been made over the course of the 20th century and 21st centuries due to the evolution of the Olympic Movement. Some of these adjustments include the creation of the Winter Olympic Games for snow and ice sports, the Paralympic Games for athletes with a disability, the Youth Olympic Games for athletes aged 14 to 18, the five Continental games (Pan American, African, Asian, European, and Pacific), and the World Games for sports that are not contested in the Olympic games. The International Olympic Committee also endorses the Deaf Olympics and Special Olympics. A range of economies, politics and technological developments has had an impact on the Indian Oil Company. As a result, Olympic Games have shifted away from pure amateurism as proposed by Coubertin in order to allow participation of professional athletes. The question of corporate sponsorship and the commercialization of the Games has been raised in view of the growing importance of mass media. The 1916, 1940 World War had forced the cancellation of this event. and 1944 Games. Participation was limited in the 1980 and 1984 Olympics because of major boycotts brought about by the Cold War. The latter, however, attracted 140 National Olympic Committees, which was a record at the time.

1.2 PURPOSE

The purpose highlights the use of a data-driven technique to analyze historical participation and performance patterns in Olympic sports. It also mentions the sources of data that will be used, such as historical records, demographic, and socioeconomic statistics. Additionally, it outlines some of the key findings and insights that the analysis will reveal, including trends in gender diversity, increasing participation from different countries, performance variability among countries, and the influence of socioeconomic factors, athlete age, and experience on Olympic performance. The ultimate goal of the analysis is to provide valuable information that can be used to improve athlete development and promote participation in Olympic sports worldwide.

CHAPTER – 2

LITERATURE SURVEY

2.1 Olympic Data Analysis using Data Science

Dhiraj Patil, Nishant Kulkarni, Parth Prabhu, Pranav Bhosale, Pranav Nair,
Pratik Patil, Pratyush Doshi, Rugved Pande (2022)

The Olympic games are international sports events with more than 200 nations participating in various competitions. The Sportspersons from various countries participate in competitions and make their countries proud of their excellence in sports. The primary objective of this paper is to analyze the Olympic dataset using Python to compare the overall performance of countries and to evaluate the contribution of each country to the Olympics. These analyses will give deeper insight into the performance of countries in the Olympics over the years and help sportspersons to quickly analyze their own and the competitor's performance. In this paper, exploratory data analysis techniques are used to provide a comparison between the performance of various countries and the contribution of each country in the Olympics. Visualization of the Olympics dataset in many aspects provides the status of countries in the Olympics and helps countries with poor performance to produce quality players and improve the nation's performance in the Olympics. An analysis needs to be done by each country to evaluate the previous statistics which will detect the mistakes, Visualization of the data over various factors will provide us with a statistical view of the various factors which lead to the evolution of the Olympic Games and Improvement in the performance of various Countries/Players over time.

2.2 Sustainable Development of Olympic Sports Participation Legacy

Alan Bairne and Pengfei Shi (2022)

After the 2022 Beijing Winter Olympics, Chinese officials claimed that the goal of “driving 300 million people to participate in ice and snow sports” had been achieved. Historically, the London 2012 Olympic Games had a similar goal: to increase sports participation for all by hosting the Olympic Games. Given these goals, the impact of the Olympic Games on sports participation has become significant. These impacts can be referred to as the Olympic sport participation legacy, an intangible Olympic legacy. The Olympic sport participation legacy has attracted a lot of researchers’ interest in the academic field in recent years. This paper aims to conduct a scoping review of Olympic sport participation legacy studies between 2000 and 2021 to identify the progress of studies on the sustainability of Olympic sport participation legacies. Unlike previous scoping reviews on sport participation legacies, this review adopts a Patterns, Advances, Gaps, Evidence of Practice, and Research Recommendations (PAGER) framework at the results analysis stage to improve the quality of the findings. The results from the scoping review contained 54 peer-reviewed articles on three levels of research: the population level, social level, and intervention processes.

2.3 Analyzing the Evolution of the Olympics by Exploratory Data analysis using R

Anubhav Nag, Kartik Agrawal and Rahul Pradhan (2022)

Olympic Games are one of the main international events and also a matter of prestige for countries and therefore each country tries to give their best performance during the event. Despite a lot of hard work, many countries/players are unable to perform well during the events and grab medals whereas many countries perform very well in the event and secure many medals. An Analysis need to be done by each country to evaluate the previous statistics which will detect the mistakes which they have done previously and will also help them in future development. An analysis can also be done by the host country to find out the mistakes in the arrangements of the Event which will help them in overcoming these mistakes and host the event accurately. The primary objective of this Research paper is to analyze the large Olympic dataset using Exploratory Data Analysis to evaluate the evolution of the Olympic Games over the years. This analysis will provide detailed and accurate information regarding various factors which lead to the evolution of the Olympic games and the improvement of Countries/Players over time in a visual format.

2.4 Big Data and Analytics in Sport Management

Joris Drayer Nicholas M. Watanabe, Stephen Shapiro (2021)

Big data and analytics have become essential components of organizational operations. The ability to collect and interpret significantly large data sets has provided a wealth of knowledge to guide decision-makers in all facets of society. This is no different in sport management where big data has been used on and off the field to guide decision-making across the industry. As big data evolves, there are concerns regarding the use of enhanced analytic techniques and their advancement of knowledge and theory. This special issue addresses these concerns by advancing our understanding of the use of big data in sport management research and how it can be used to further scholarship in the sports industry. The six articles in this special issue each play a role in advancing sports analytics theory, producing new knowledge, and developing new inquiries. The implications discussed in these articles provide a foundation for future research on this evolving area within the field of sport management.

2.5 Predictive Analytics of Performance of India in the Olympics Using Machine Learning Algorithms

K Deepthi Reddy, J Padma Priya, Rayala Lohitha, Sreethi Musunuru, Varagiri Shailaja (2020)

India is a country which all the time maintained an exciting pitch and intense exhilaration for sports. Different reasons have been insinuated for India's lack of tendency to stand atop the podium in the Olympics. A natural endowment can take the athletes only to some extent, but support and encouragement in either financial, emotional, or physical form are essential aspects that are necessary to an athlete and without them, the source can often be hopeless. The potential of education is substantial, and sports are considered a source of relaxation and amusement for millions of youth who are aspiring to be at the top of their class in a country where there are millions of unemployed. The combination of this with terrible food habits, inefficient coaching, bad rehab facilities, increase in competition in schools, shortfall of exercise with physical education, and long commutes from work results in many talents getting wasted. Despite all this, we see that India's cricket team is considered one of the world's best cricket teams of all time. But at the same time, we are not able to bring the same commitment and rectitude to the other sports, the Olympics in particular. When all the nations are ranked in the order of the number of medals they have won over the years, India ranks at the fifty-fifth position. To understand the medal deficiency, various attributes are reconsidered.

2.6 Data Analytics on Olympics Datasets

Suraj Kum, Surya Sena Reddy (2022)

Today, the Olympics is one of the most famous sporting events across the world, with almost all major countries taking part in it. Over time, the Olympics has marketed itself to the countries and general public in such a way that winning a medal in this competition has become a prestigious issue. Moreover, these games contribute to world peace and coordination among the world countries. The primary purpose of this paper is to publish the results of performing careful data analytical operations on the data collected from the Olympics from 1896 to 2016. This analysis aids in developing resourceful knowledge from the data, about the athlete's and countries' performance. For this purpose, two datasets are considered, namely Athlete Events and Athlete BMI. This paper finds its base in the Descriptive and Predictive forms of Analytics. Descriptive Analytics helps in knowing what has happened in a clear way such that one can look for reasons to substantiate the findings. Whereas, Predictive analytics casts light on what would happen or what should happen scenarios.

CHAPTER - 3

IDEATION & PROPOSED SOLUTION

3.1 PROBLEM STATEMENT DEFINITION

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Sport s player	Improve my performance	Some Important data about my sport are missing	Of there is no good data analytics in my field of sports	Helpless.
PS-2	Coach	Improve my students performance	Previous year data are missing	Of maintenance of record	Not a good coach because I can not help my students.

Data-Driven Insights on Olympic Sports Participation and Performance

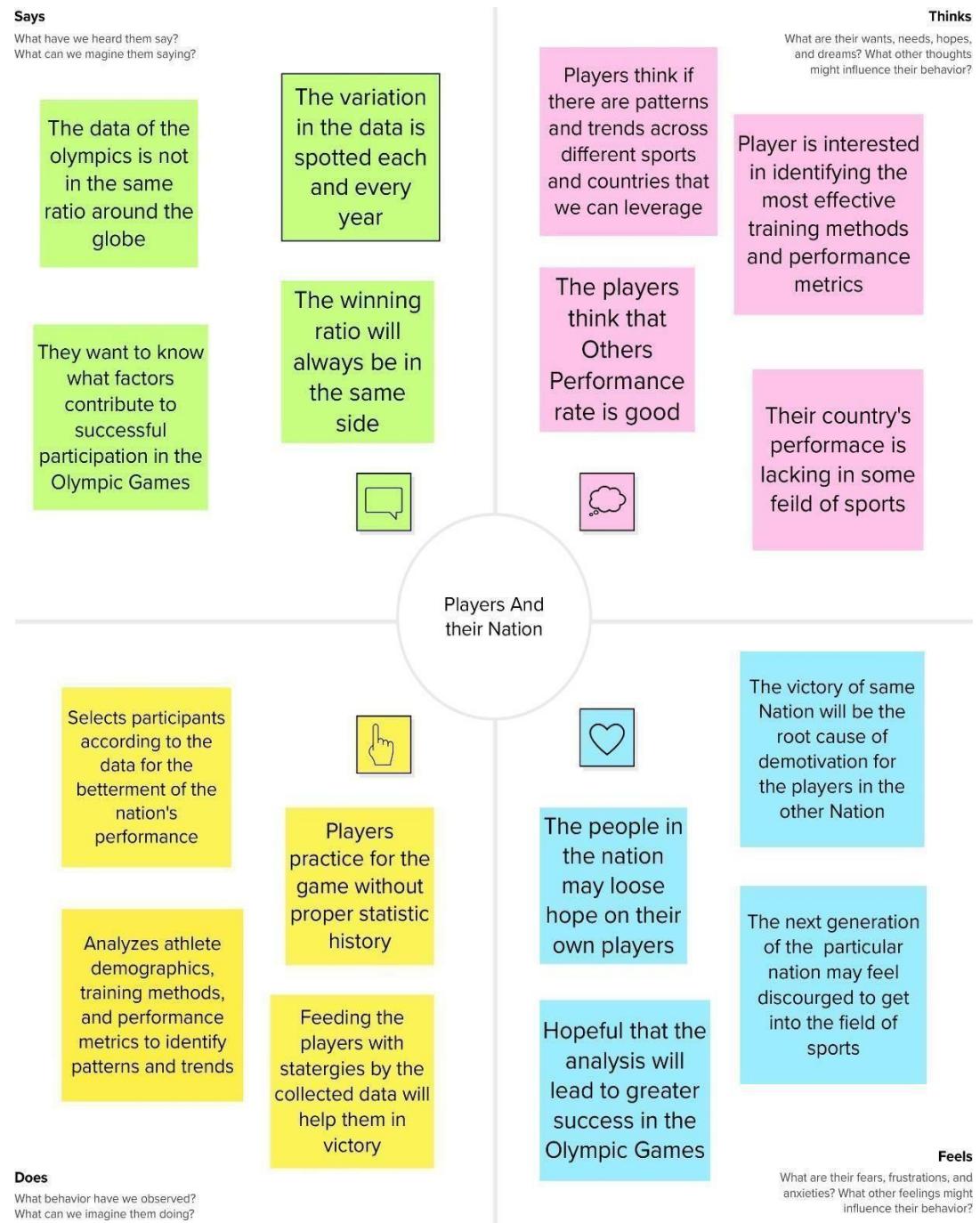
The problem statement for data-driven insights of Olympic sports participation and performance is to analyze and understand the factors that contribute to successful participation in the Olympic Games. This includes identifying patterns and trends in athlete demographics, training methods, and performance metrics across different sports and countries. By leveraging data from past Olympic Games and other relevant sources, the goal is to uncover insights that can inform strategies for improving athlete development, training programs, and overall performance at the Olympic level. Ultimately, this analysis aims to help athletes, coaches, and sports organizations make data-driven decisions that lead to greater success in the Olympic Games.



3.2 EMPATHY MAP

An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community. Have the team members speak about the sticky notes as they place them on the empathy map. Ask questions to reach deeper insights so that they can be elaborated for the rest of the team. To help bring the user to life, you may even wish to sketch out the characteristics this person may have on the center of the face.

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3.3 IDEATION & BRAINSTROMING

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

⌚ 10 minutes

TIP
You can select a sticky note and hit the pencil (shift+left click) icon to start drawing!

Person 1		Person 2		Person 3		Person 4	
Data Analysis can help countries to improve their performance	Many players emerge with good statistics in a particular sport	Analysis helps players to relieve from stress	Analyzing the demographics like age, gender, height etc to identify the patterns and trends	Practicing the training methods of successful countries	To examine performance data from past olympics	Analyze athlete demographic data, including age, gender, nationality, to identify trends in Olympic sports participation over time.	Analyze training methods and techniques used by successful athletes and coaches to identify best practices.
Players can know the area of improvement	Team sports can improve their lacking teamwork	Can increase their time of practice in particular sport which is tough for them	Conducting the country level analysis to fetch data	Using the data to inform the strategies to the players	Identifying and implementing the new technologies which can be used for olympics	Compare athlete performance data across different countries and sports to identify areas of strength and weakness	Analyze data on athlete nutrition and hydration to identify patterns
Data Analytics can educate people to practice and participate in sports	The funding for least known sports can improve performance in that sports	For injured player a nation can provide insurance, this can lead to more participation	Preparing the players both physically and mentally	collaborating with other sports for the better tips and tricks	Creating the awareness on the countries which has less participation in sports	Identify opportunities for sports organizations to build their brand	use social media and other digital data to analyze athlete
			Analyze athlete characteristics and training regimens, such as age, gender, and nationality, to compare and analyze performance in different Olympic sports.	Evaluation of training methods and techniques: Use machine learning algorithms to analyze the effectiveness of different training methods and techniques across different sports.	Analyze trends in athlete performance over time, including changes in performance metrics, training methods, and competition results.		Analysis of the impact of Olympic rule changes
			This could provide insights into how the sport has evolved and identify areas for further improvement.	Compare athlete performance across different countries and regions, and identify potential areas for international development programs and training strategies.	This could help coaches and athletes identify the most effective strategies for improving performance.		Analysis of the impact of Olympic rule changes
			Analysis of the impact of Olympic rule changes	This could provide insights into how rule changes can impact athlete development and performance strategies.			

A group idea is a concept or plan formulated by a collective of individuals with a shared vision and objectives. It represents the thoughts and goals that the group seeks to pursue together.

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3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

⌚ 20 minutes

TIP
Add a color code to your notes to make it easier to find, review, organize and categorize topics. Ideas as themes will fit your mind.

By analyzing the athlete's demographic data we may able to conclude with the trends and the pattern of them

The collection of data of the past history will help us in prediction and training

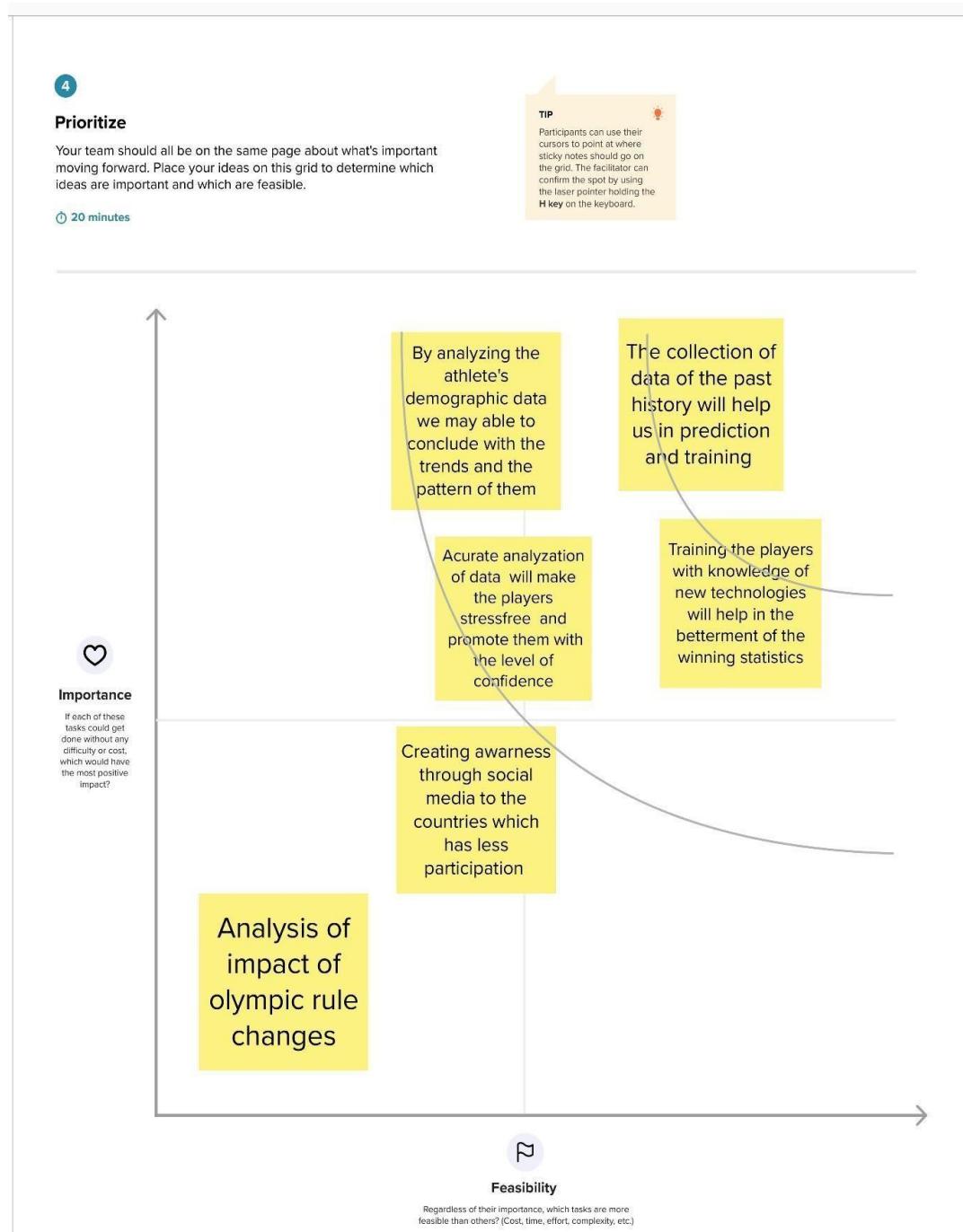
Training the players with knowledge of new technologies will help in the betterment of the winning statistics

Creating awareness through social media to the countries which has less participation

Acurate analyzation of data will make the players stressfree and promote them with the level of confidence

Analysis of impact of olympic rule changes

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3.4 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The lack of data analytics in the Olympic games will result in a suboptimal understanding of athlete performance and training strategies, leading to missed opportunities for enhancing overall medal counts and improving athlete welfare.
2.	Idea / Solution description	To analyze and understand the factors contributing to successful Olympic Games participation. This includes identifying patterns and trends in athlete demographics, training methods, and performance metrics across different sports and countries. By leveraging data from past Olympic Games and other relevant sources, the goal is to uncover insights that can inform strategies for improving athlete development, training programs, and overall performance at the Olympic level. Ultimately, this analysis aims to help athletes, coaches, and sports organizations make data-driven decisions leading to greater Olympic Games success.
3.	Novelty / Uniqueness	The uniqueness of the project depends on the research question, Data Science, Analytical techniques, and Collaborative efforts.
4.	Social Impact / Customer Satisfaction	It can help the players and the countries that participate in the Olympics to

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		perform better which will lead to a good social status for the respective.
5.	Business Model (Revenue Model)	By creating an analysis of Olympic data every country can perform well with the stats which can help them get more viewership for the same. By this, they earn a certain amount which will be useful.
6.	Scalability of the Solution	The high amount of data collected from various sources like social media will increase the scalability of the solution. The analytical techniques will also promote the raise in the scalability as project utilizes automated analytics.

CHAPTER - 4

SOLUTION REQUIREMENTS

4.1 FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Login	The user should login to the system by using valid user credentials
FR-4	Dataset	Upload dataset into the analytics tool.
FR-5	Analysis	It involves gathering all the information, processing it exploring the data, and using it to find patterns and other insights.
FR-6	Create Dashboard	Create Charts, Graphs, Tables, etc.
FR-7	Reporting	The reporting function helps users have complete control over their business. The real-time reporting collects current information and displays the data on anintuitive user interface

4.2 NON-FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Optimized resources and it can be used by everyone
NFR-2	Security	Anyone with correct Log in credentials can view the Dashboards/Templates
NFR-3	Reliability	Templates are reliable because we are uploading and accessing it through Cloud
NFR-4	Performance	It has high state of performance and efficiency
NFR-5	Availability	It is free of cost and available to everyone who wants to know about sales data
NFR-6	Scalability	Dashboards/Templates are very much Scalable, the user can modify the metrics whenever they want.

CHAPTER 5

PROJECT DESIGN

5.1 SOLUTION & TECHNOLOGY ARCHITECTURE

Solution architecture refers to the process of designing and describing the structure and behavior of a software solution that addresses specific business requirements. It involves defining the components, relationships, and interactions between various software elements to create a cohesive and functional system.

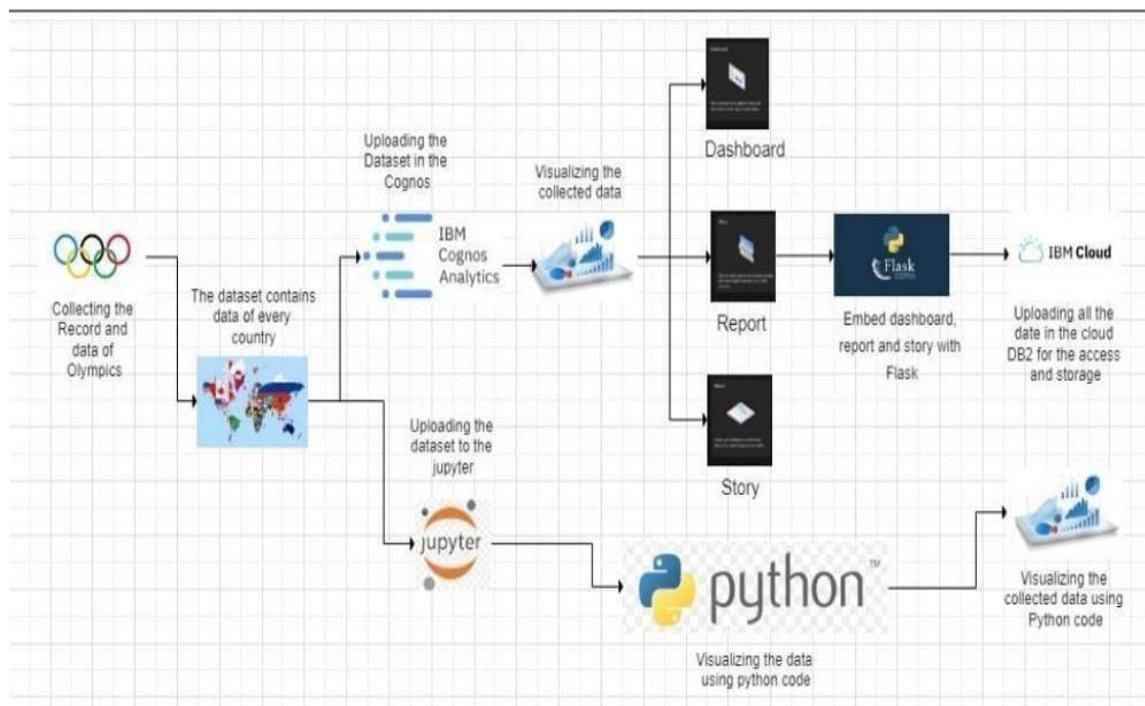


FIG 5.1.1 SOLUTION ARCHITECTURE

Technical architecture refers to the structure and organization of the hardware, software, networks, and other technical components that make up an information system or software application. It defines how these components interact and work together to support the desired functionality and performance of the system.

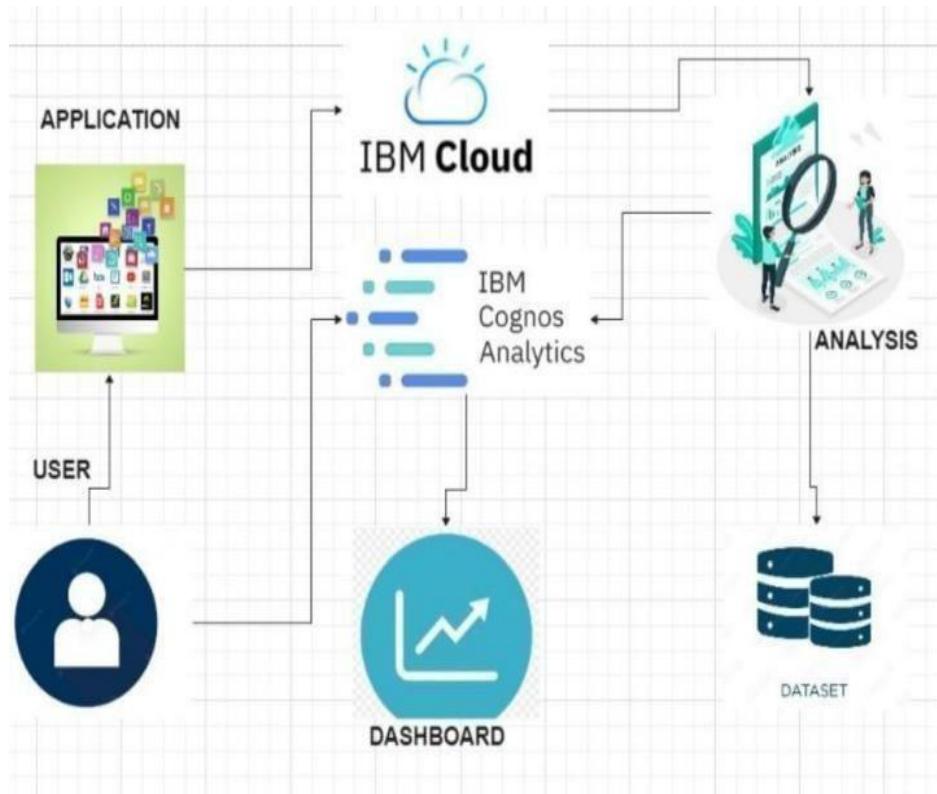


FIG 5.1.2 TECHNICAL ARCHITECTURE

5.2 DATA FLOW DIAGRAM

A data flow diagram (DFD) is a graphical representation that illustrates the flow of data within a system or process. It is commonly used in software engineering and systems analysis to visualize the movement and transformation of data as it moves through different stages or components of a system.

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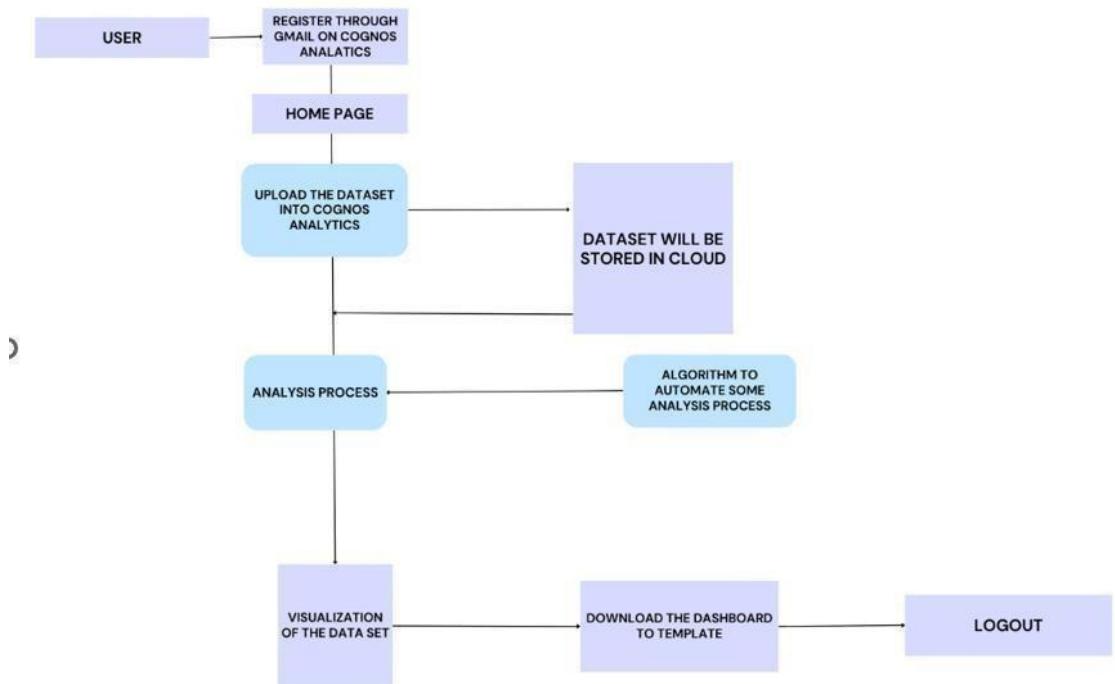


FIG 5.2 DATA FLOW DIAGRAM

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Member
Customer (Web user)	Registration	USN-1	As a user, I can register for the application by entering my email, and password, and confirming my password.	I can access my account/dashboard	High	Muralikkris hnan S
		USN-2	As a user, I will receive a confirmation email once I have registered for the application	I can receive a confirmation email & click confirm	High	Omsre R

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User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Team Member
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Mohanasan daram S G
		USN-4	As a user, I can register for the application through Gmail		Medium	Poopathiraja P
	Login	USN-5	As a user, I can log into the application by entering my email & password		High	Mohanasan Daram S G
	Dashboard	USN-6	User can able to see and upload dataset option in the browser	The user can upload the dataset into the Cognos analytics	High	Muralikrishnan S
	Dashboard	USN-7	If the user already used the Cognos analytics, we can able to see the previously uploaded dataset		Low	Mohanasundaram S G
Admin	Login	USN-8	As an admin, I can login to the application by entering username & password		High	Omsre R
	Dashboard	USN-9	As an admin, I can view the dashboard and other activities of the application	I can access the dashboard	High	Poopathiraja P

CHAPTER - 6

CODING AND SOLUTION

6.1 FEATURE 1

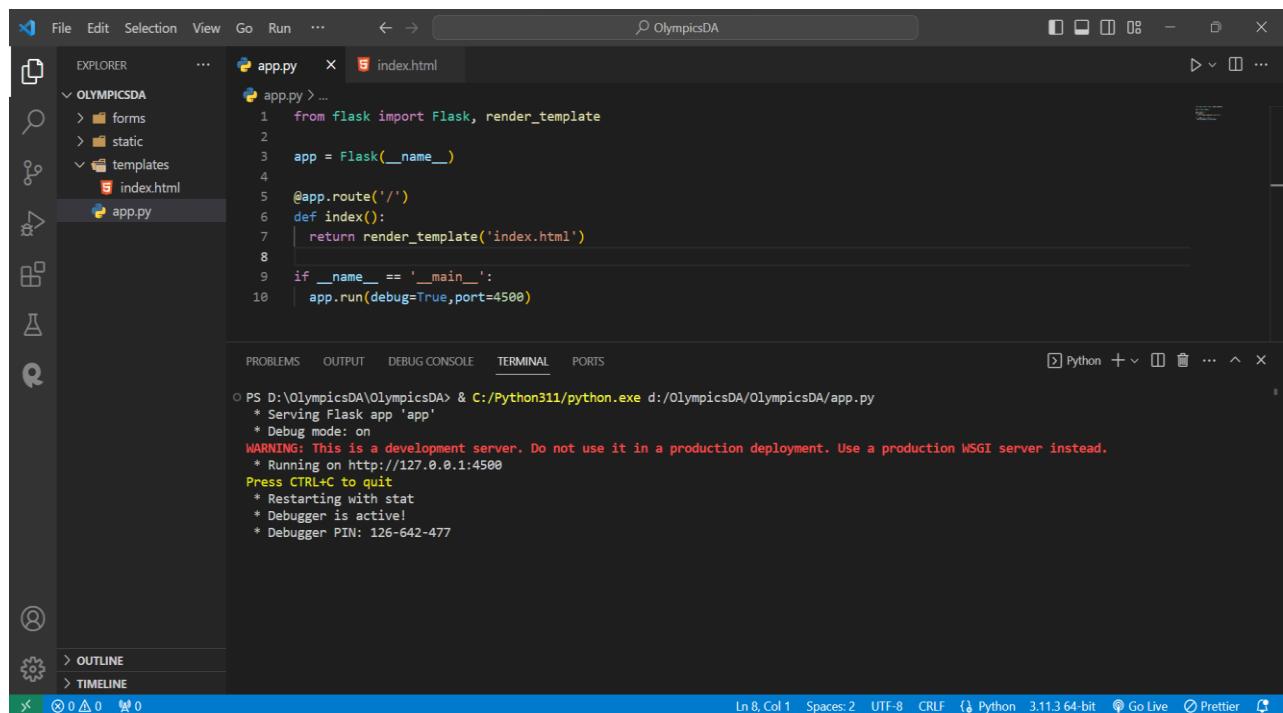
```
from flask import Flask, render_template
```

```
app = Flask(__name__)

@app.route('/')
def home():

    return render_template('index.html')

if __name__ == "__main__":
    app.run(debug=True, port=4500)
```



The screenshot shows the Visual Studio Code interface with the following details:

- File Explorer:** Shows a project structure for "OLYMPICSDA" containing "forms", "static", and "templates" folders, along with "app.py" and "index.html".
- Code Editor:** Displays the Python code for "app.py".
- Terminal:** Shows the command line output of running the application. It includes a warning about using a development server in production and provides a debugger PIN.
- Status Bar:** Shows file statistics (Ln 8, Col 1), code analysis results (0△ 0), and tooling information (Python 3.11.3 64-bit, Go Live, Prettier).

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DASHBOARD

```
<section id="dashboard" class="dashboard">
```

<h2>DASHBOARD</h2>

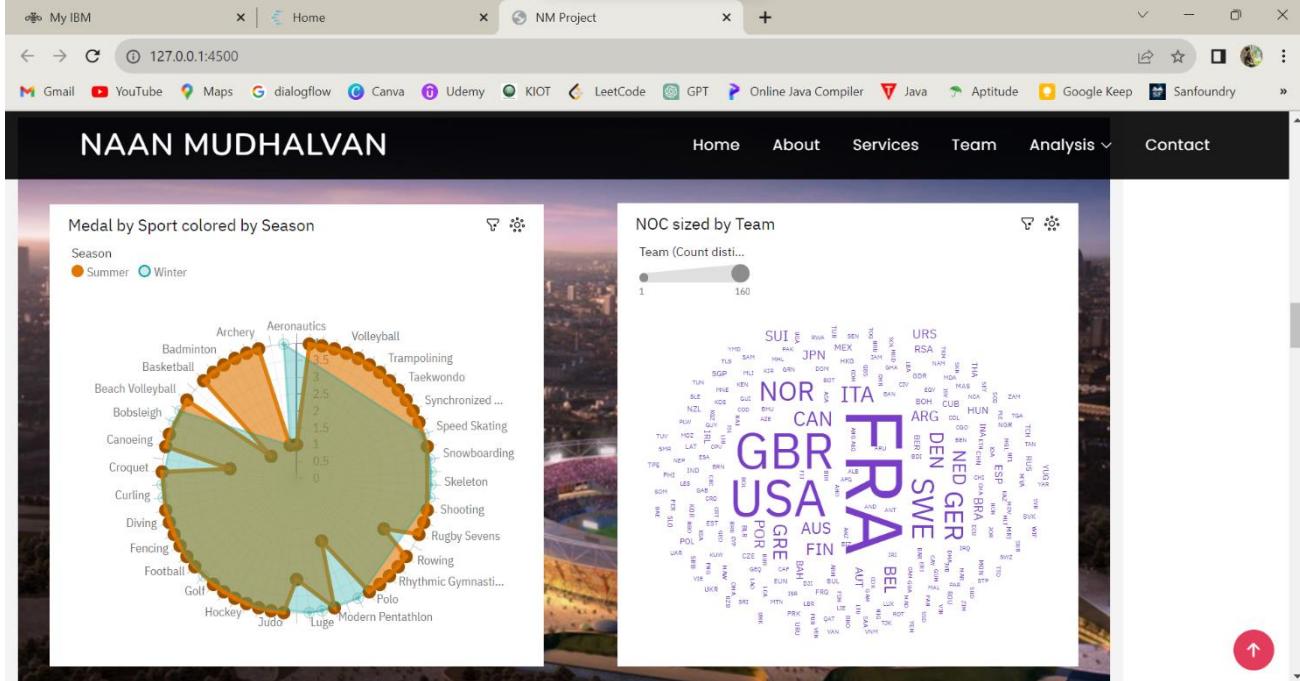
```
<div class="container1">
```

<iframe

```
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FOLYMPIC%2Bdashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018b46151716_00000000" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
```

</div>

</section>



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STORY

```
<section id="Story" class="Story">
```

```
    <h2>STORY</h2>
```

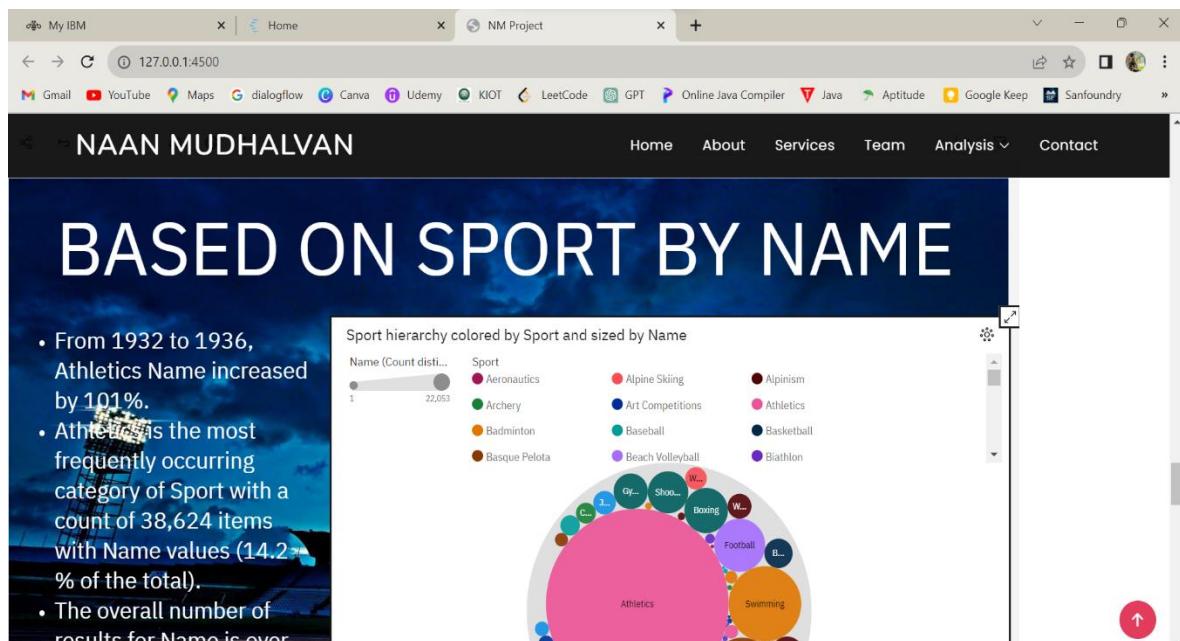
```
    <div class="container3">
```

```
        <iframe
```

```
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FOLYMPIC%2Bstory&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=model0000018b43407087_00000000&sceneTime=0" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
```

```
    </div>
```

```
    </section>
```



REPORT

```
<section id="Report" class="Report">
```

```
    <h2>REPORT</h2>
```

```
    <div class="container2">
```

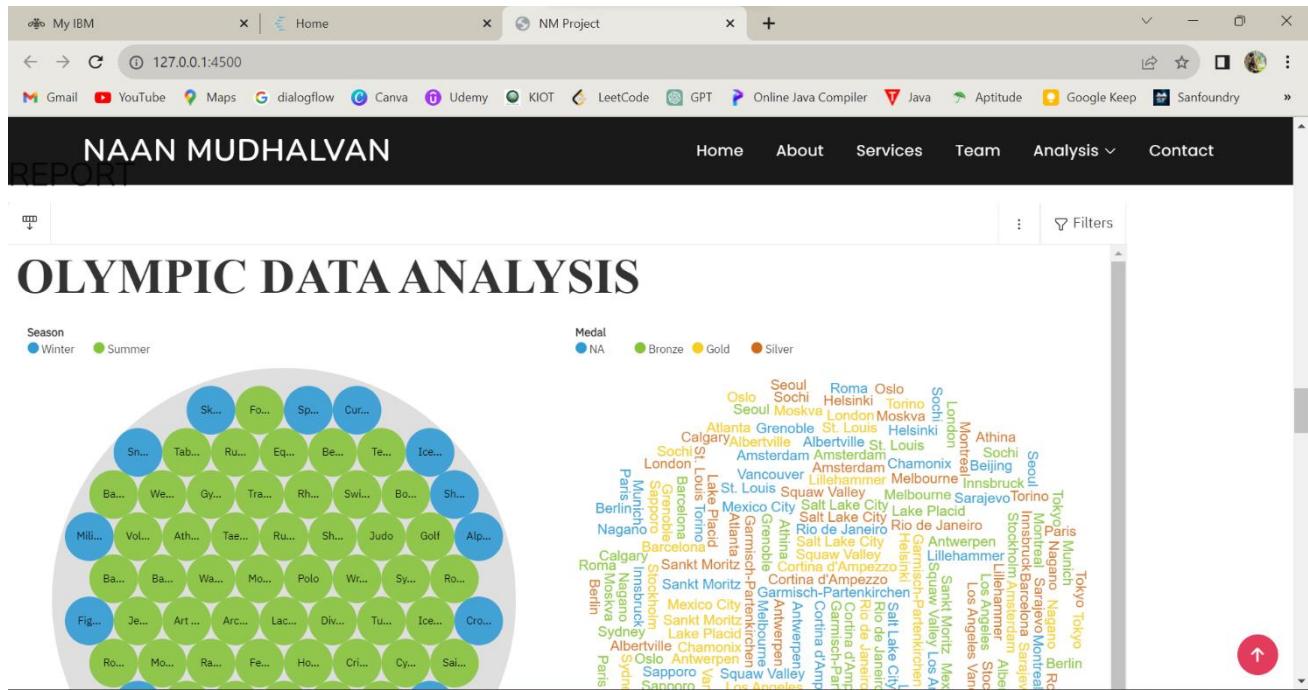
```
        <iframe
```

```
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FOLYMPIC%2Breport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
```

```
    </div>
```

```
    </section>
```

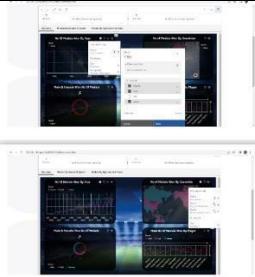
Data-Driven Insights on Olympic Sports Participation and Performance



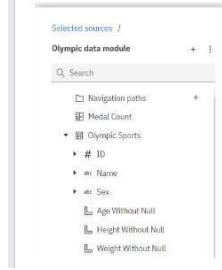
CHAPTER -7

RESULTS

7.1 PERFORMANCE METRICS

S.No	Parameter	Screenshot / Values
1.	Dashboard design	<p>No of Visualizations / Graphs –</p> <ol style="list-style-type: none">1. No Of Medals Won By Year2. No of Medals Won By Countries3. Male & Female Won No Of Medals4. Most No Of Medals Won By Player5. Top 3 Females Won Most No Of Medals6. Top 3 Males Won Most No Of Medals7. Won Gold Medals In Sports8. Won Silver Medals In Sports9. Male & Female Players Average Age & Height In Centimeters10. Medal Count By Events11. Gold, Silver & Bronze Medals Count by Team12. Total Medal Counts By Team
2.	Data Responsiveness	

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Participation and Performance

3.	Utilization of Data Filters	
4.	Effective User Story	No of Scene Added - 3 Scenes
5.	Descriptive Reports	No of Visualizations / Graphs - 12

CHAPTER - 8

ADVANTAGES & DISADVANTAGES

8.1 ADVANTAGES

- This type of analysis can help identify important factors that contribute to athlete success, such as the impact of gender diversity, the growth of participation from different countries, and the influence of socioeconomic factors like GDP and population size. Understanding these factors can inform strategies for athlete development, training programs, and resource allocation to improve performance in specific sports.
- The analysis can reveal the performance variability of different countries over time. This information can be valuable for countries looking to enhance their performance in specific sports or identify areas where they have consistently excelled. By studying the success patterns of countries with consistent high performance, other nations can learn from their strategies and approaches to athlete development.
- The data-driven analysis can provide valuable insights into the impact of athlete age and experience on Olympic performance. Understanding the relationship between age, experience, and performance can help guide athlete selection processes and inform decisions on training and competition schedules.
- The advantage of this data-driven analysis lies in its ability to provide empirical evidence and objective insights into the patterns and trends

be used to shape policies, programs, and strategies aimed at improving athlete development and promoting participation in these sports globally.

8.2 DISADVANTAGES

- 1. Data limitations: The analysis heavily relies on the availability and quality of historical data. In some cases, data may be incomplete, inconsistent, or biased, which can limit the accuracy and reliability of the findings. Missing or erroneous data can lead to misleading conclusions or prevent researchers from fully understanding certain aspects of participation and performance patterns.
- 2. Complexity and context: Olympic sports involve a complex interplay of various factors, including cultural, social, and economic contexts. While data analysis can provide valuable insights, it may oversimplify or overlook some of the nuanced aspects that contribute to performance. Factors such as coaching expertise, training facilities, cultural attitudes towards sports, and individual athlete motivations may not be adequately captured by the data alone.
- 3. Changing landscape: The sporting landscape is dynamic, with new sports being introduced, rules evolving, and geopolitical factors shifting over time. Historical data analysis may not fully capture these changes or account for the potential impact they have on participation and performance patterns. Therefore, relying solely on past data may not provide a comprehensive understanding of the current and future dynamics of Olympic sports.

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- 4. Causality and correlation: While data analysis can identify correlations between certain factors and performance, establishing a direct causal relationship can be challenging. There may be confounding variables or underlying factors that are not captured or adequately accounted for in the analysis. As a result, drawing definitive conclusions about the causal influence of certain factors on performance can be difficult.

CHAPTER – 9

CONCLUSION

The analysis of historical participation and performance patterns in Olympic sports using a data-driven technique has provided valuable insights into the factors that influence the success of elite athletes. The study has highlighted several key findings:

- 1. Gender Diversity:** There has been a positive trend towards increased gender diversity in the sports represented at the Olympic Games. This signifies progress towards gender equality in sports and highlights the importance of promoting inclusivity.
- 2. Growing Participation:** The number of countries competing in the Olympics has been steadily increasing over time. This indicates a growing interest and participation in Olympic sports worldwide, fostering a more global and diverse sporting community.
- 3. Performance Variability:** While some countries have shown significant variability in their performance throughout different Olympic Games, others have consistently excelled across a range of sports. This suggests the presence of various factors, such as athletic development programs, infrastructure, and sporting culture, that contribute to sustained success.
- 4. Socioeconomic Factors:** The analysis underscores the importance of socioeconomic factors, such as GDP and population size, in predicting Olympic performance. Countries with larger economies and populations generally have greater resources to invest in athlete development and sports infrastructure, which can positively impact performance.

5. Athlete Age and Experience: The study highlights the significance of athlete age and experience in Olympic performance. It suggests that athletes with more experience and maturity tend to have an advantage, indicating the need for long-term athlete development programs and opportunities for athletes to gain valuable experience.

These insights provide valuable information for formulating strategies to enhance athlete development, foster participation, and improve performance in Olympic sports worldwide. By understanding the patterns and trends revealed in this analysis, stakeholders can work towards creating more inclusive and supportive sporting environments that enable athletes to reach their full potential.

CHAPTER - 10

FUTURE SCOPE

The future scope of this analysis is vast and holds great potential for further exploration and application. Here are some key areas where this data-driven technique can have a significant impact:

- 1. Talent identification and athlete development:** The analysis can be utilized to identify patterns and factors that contribute to successful athlete development in various sports. By understanding the socioeconomic, demographic, and performance-related variables that influence Olympic success, sports organizations and governing bodies can develop targeted talent identification programs and implement effective athlete development strategies. This can help nations enhance their competitive advantage and optimize resource allocation towards sports where they have a higher likelihood of success.
- 2. Policy and funding decisions:** The insights gained from this analysis can assist policymakers and funding agencies in making informed decisions related to sports policies, resource allocation, and funding distribution. By considering the historical patterns of participation and performance, countries can identify sports with untapped potential and invest resources accordingly. This can lead to the development of robust sports infrastructure, training facilities, coaching programs, and athlete support systems to improve overall performance at the Olympics.
- 3. Gender diversity and inclusivity:** The analysis highlights the increasing gender diversity in Olympic sports over time. This information can be instrumental in promoting further inclusivity and gender equality in sports.

By understanding the historical trends and identifying areas where gender is still lacking, sports organizations and governing bodies can implement initiatives to encourage and support female participation in traditionally male-dominated sports. This can involve providing equal opportunities, resources, and support systems to female athletes, as well as addressing any systemic barriers that hinder their participation and success.

4. Predictive modeling and performance forecasting: The data-driven approach used in this analysis can form the foundation for predictive modeling and performance forecasting in Olympic sports. By incorporating additional variables such as training methodologies, technological advancements, and advancements in sports science, researchers and sports organizations can develop models that estimate future performance trends and identify emerging talent. This can be invaluable for strategic planning, talent acquisition, and decision-making processes within the sports industry.

CHAPTER – 11

APPENDIX

A.1 SOURCE CODE

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>NM Project</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <link href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Nunito:300,300i,400,400i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">
  <!-- Vendor CSS Files -->
  <link href="/static/assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="/static/assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="/static/assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
  <link href="/static/assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="/static/assets/vendor/remixicon/remixicon.css" rel="stylesheet">
  <link href="/static/assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">

  <link rel="stylesheet" href="/static/assets/css/style.css">
</head>
```

Data-Driven Insights On Olympic Sports Participation And Performance

```
<body>

<!-- ===== Header ===== -->
<header id="header" class="fixed-top">
  <div class="container d-flex align-items-center justify-content-between">

    <h1 class="logo"><a href="index.html">NAAN MUDHALVAN</a></h1>
    <nav id="navbar" class="navbar">
      <ul>
        <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
        <li><a class="nav-link scrollto" href="#about">About</a></li>
        <li><a class="nav-link scrollto" href="#services">Services</a></li>
        <li><a class="nav-link scrollto" href="#team">Team</a></li>
        <li class="dropdown"><a href="#"><span>Analysis</span> <i class="bi bi-chevron-down"></i></a>
          <ul>
            <li><a href="#dashboard">Dashboard</a></li>
            <li><a href="#Report">Report</a></li>
            <li><a href="#Story">Story</a></li>
          </ul>
        </li>
        <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav><!-- .navbar -->

  </div>
</header><!-- End Header -->
```

Data-Driven Insights On Olympic Sports Participation And Performance

```
<section id="hero">
  <div class="hero-container">
    <h1>Data-Driven insights on Olympic Sports Participation and Performance</h1>
    <h2>Ensure fair play and integrity in the Olympic Games</h2>
    <a href="#about" class="btn-get-started scrollto">Get Started</a>
  </div>
</section><!-- End Hero -->

<main id="main">

  <!-- ===== About Section ===== -->
  <section id="about" class="about">
    <div class="container">

      <div class="section-title">
        <h2>About</h2>
        <h3>Learn More <span>About Us</span></h3>
        <p>Data-Driven insights on Olympic Sports Participation and Performance</p>
      </div>

      <div class="row content">
        <div class="col-lg-6">
          <p>Data-driven insights on Olympic sports participation and performance involve the collection, analysis, and interpretation of data related to athletes, countries, and sports events in the Olympic Games.</p>
          <ul>
            <li><i class="ri-check-double-line"></i> It can also help identify trends in athlete profiles over the years.</li>
            <li><i class="ri-check-double-line"></i> Data can reveal trends in the popularity of different sports over time.</li>
            <li><i class="ri-check-double-line"></i> Studying historical data on medal counts, records, and rankings for each Olympic event can help identify trends in performance.</li>
          </ul>
        </div>
        <div class="col-lg-6 pt-4 pt-lg-0">
          <p>Data-driven insights in Olympic sports participation and performance rely on a combination of historical data, real-time data collection during the games, and advanced analytical techniques. These insights can be used to make informed decisions, improve training and development programs, enhance the overall Olympic experience, and promote fairness and inclusivity in the world of sports.</p>
        </div>
      </div>
    </div>
  </section>
```

```
<section id="services" class="services">
  <div class="container">

    <div class="section-title">
      <h2>Services</h2>
      <h3>We do offer <span>Services</span></h3>
      <p>These insights can provide valuable information for athletes, coaches, sports organizations, and researchers. </p>
    </div>

    <div class="row">
      <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5 mb-lg-0">
        <div class="icon-box">
          <div class="icon"><i class="bx bxl-dribbble"></i></div>
          <h4 class="title"><a href="">Performance Metrics</a></h4>
          <p class="description">Collecting data on athletes' physical attributes, training regimes, and competition statistics can help identify key performance indicators.</p>
        </div>
      </div>
    </div>

    <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5 mb-lg-0">
      <div class="icon-box">
        <div class="icon"><i class="bx bx-file"></i></div>
        <h4 class="title"><a href="">Injury Analysis</a></h4>
        <p class="description"> Data can help identify common injuries in different sports and how they affect athletes' performance. </p>
      </div>
    </div>

    <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5 mb-lg-0">
      <div class="icon-box">
        <div class="icon"><i class="bx bx-tachometer"></i></div>
        <h4 class="title"><a href="">Economic Impact</a></h4>
        <p class="description"> Studying the economic impact of the Olympics on host cities and countries can provide insights into the financial aspects of sports participation.</p>
      </div>
    </div>

    <div class="col-md-6 col-lg-3 d-flex align-items-stretch mb-5 mb-lg-0">
      <div class="icon-box">
        <div class="icon"><i class="bx bx-world"></i></div>
        <h4 class="title"><a href="">Geographical Analysis</a></h4>
        <p class="description">It highlight the impact of geography on sports participation.</p>
      </div>
    </div>

  </div>
</section><!-- End Services Section -->
```

Data-Driven Insights On Olympic Sports Participation And Performance

```
<section id="cta" class="cta">
  <div class="container">

    <div class="text-center">
      <h3>Motive</h3>
      <p> Sharing success stories and profiles of athletes can inspire future generations of Olympians. Knowing the journey and challenges faced by athletes can motivate others to pursue their Olympic dreams.</p>
      <a class="cta-btn" href="#">Return to Home</a>
    </div>

  </div>
</section><!-- End Cta Section -->

<!-- ===== Dashboard =====-->
<section id="dashboard" class="dashboard">
  <h2>DASHBOARD</h2>
  <div class="container1">
    <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FOLYMPIC%2Bdashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018b46151716_00000000" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
  </div>
</section>
<!-- ===== Report =====-->
<section id="Report" class="Report">
  <h2>REPORT</h2>
  <div class="container2">
    <iframe
src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FOLYMPIC%2Breport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
  </div>
</section>
<!-- ===== Story =====-->
<section id="Story" class="Story">
  <h2>STORY</h2>
  <div class="container3">
    <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FOLYMPIC%2Bstory&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=model0000018b43407087_00000000&sceneTime=0" width="1100" height="1000" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
  </div>
</section>
```

```
<section id="team" class="team">
  <div class="container">

    <div class="section-title">
      <h2>Team</h2>
      <h3>Our Hardworking <span>Team</span></h3>
      <p>Our team is well-structured, with each member contributing a unique set of skills and expertise that align with the project's needs. This diversity allows us to cover a wide range of tasks and responsibilities efficiently</p>
    </div>

    <div class="row">

      <div class="col-lg-3 col-md-6 d-flex align-items-stretch">
        <div class="member">
          <div class="member-img">
            </div>
          <div class="member-info">
            <h4>MURALIKRISHNAN S</h4>
            <span>Team Leader</span>
          </div>
        </div>
      </div>

      <div class="col-lg-3 col-md-6 d-flex align-items-stretch">
        <div class="member">
          <div class="member-img">
            </div>
          <div class="member-info">
            <h4>MOHANASUNDARAM S G</h4>
            <span>Team Member</span>
          </div>
        </div>
      </div>
    </div>
  </div>
</section>
```

```
<div class="col-lg-3 col-md-6 d-flex align-items-stretch">
  <div class="member">
    <div class="member-img">
    </div>
    <div class="member-info">
      <h4>POOPATHIRAJA PERIYASAMY</h4>
      <span>Team Member</span>
    </div>
  </div>
</div>

<div class="col-lg-3 col-md-6 d-flex align-items-stretch">
  <div class="member">
    <div class="member-img">
    </div>
    <div class="member-info">
      <h4>OMSRE R</h4>
      <span>Team Member</span>
    </div>
  </div>
</div>

</div>
</div>
</section><!-- End Team Section -->
```

```
<!-- ===== Contact Section ===== -->
<section id="contact" class="contact">
  <div class="container">

    <div class="section-title">
      <h2>Contact</h2>
      <h3>Contact <span>Us</span></h3>
      <p>For any queries you can contact us by the below credentials</p>
    </div>

    <div class="info">
      <div class="address">
        <i class="bi bi-geo-alt"></i>
        <h4>Location:</h4>
        <p>A108 Adam Street, New York, NY 535022</p>
      </div>

      <div class="email">
        <i class="bi bi-envelope"></i>
        <h4>Email:</h4>
        <p>mailinfo@gmail.com</p>
      </div>

      <div class="phone">
        <i class="bi bi-phone"></i>
        <h4>Call:</h4>
        <p>+91 9876543210</p>
      </div>

    </div>
  </div>
</section><!-- End Contact Section -->

</main><!-- End #main -->
```

<!-- ===== Footer ===== -->

<footer id="footer">

<div class="footer-top">

<div class="container">

<div class="row">

<div class="col-lg-3 col-md-6 footer-contact">

<h3>Address</h3>

<p>

A108 Adam Street

New York, NY 535022

United States

Phone: +91 9876543210

Email: mailinfo@gmail.com

</p>

</div>

```
<div class="col-lg-2 col-md-6 footer-links">  
    <h4>Useful Links</h4>  
    <ul>  
        <li><i class="bx bx-chevron-right"></i> <a href="#">Home</a></li>  
        <li><i class="bx bx-chevron-right"></i> <a href="#about">About  
            us</a></li>  
        <li><i class="bx bx-chevron-right"></i> <a  
            href="#services">Services</a></li>  
        <li><i class="bx bx-chevron-right"></i> <a href="#">Terms of  
            service</a></li>  
        <li><i class="bx bx-chevron-right"></i> <a href="#">Privacy  
            policy</a></li>  
    </ul>  
    </div>  
</div>  
</div>
```

```
<div class="container d-md-flex py-4">

<div class="me-md-auto text-center text-md-start">

<div class="copyright">
    &copy; Copyright <strong><span>NM</span></strong>. All Rights Reserved
</div>

<div class="credits">
    Designed by <a href="">Murali</a>
</div>

</div>

<div class="social-links text-center text-md-right pt-3 pt-md-0">

    <a href="#" class="twitter"><i class="bx bxl-twitter"></i></a>

    <a href="#" class="facebook"><i class="bx bxl-facebook"></i></a>

    <a href="#" class="instagram"><i class="bx bxl-instagram"></i></a>

    <a href="#" class="google-plus"><i class="bx bxl-skype"></i></a>

    <a href="#" class="linkedin"><i class="bx bxl-linkedin"></i></a>

</div>

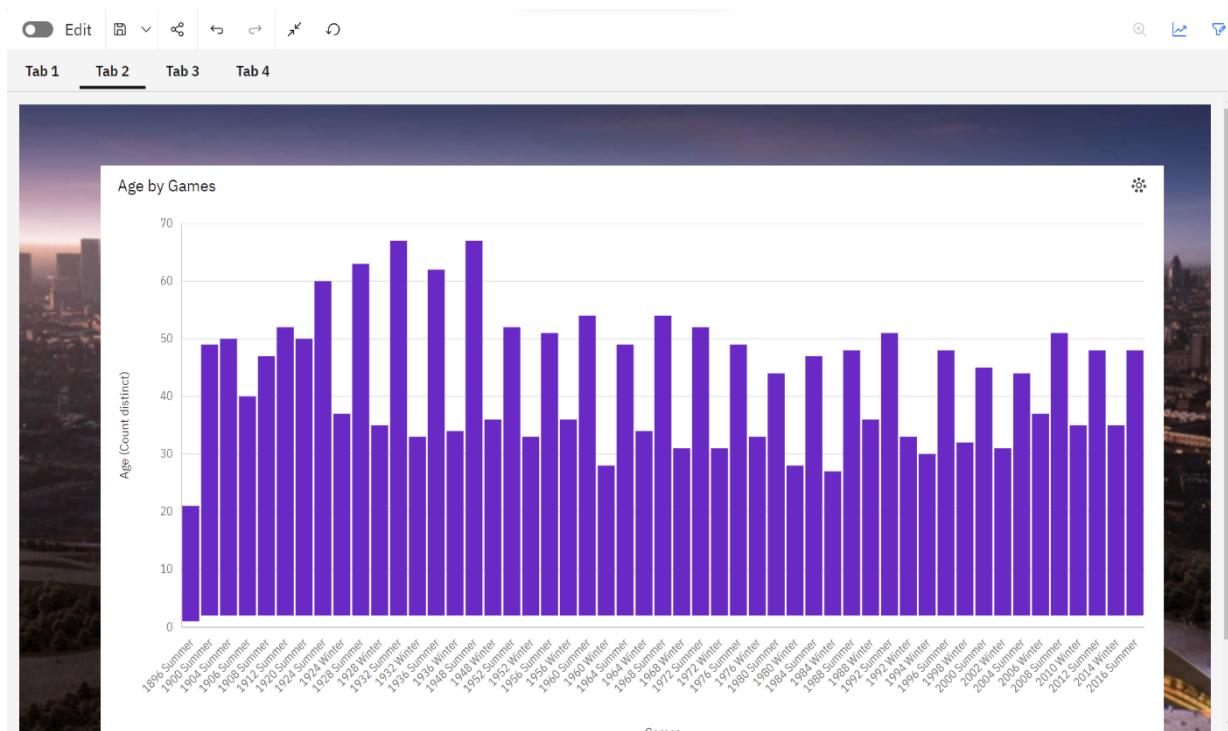
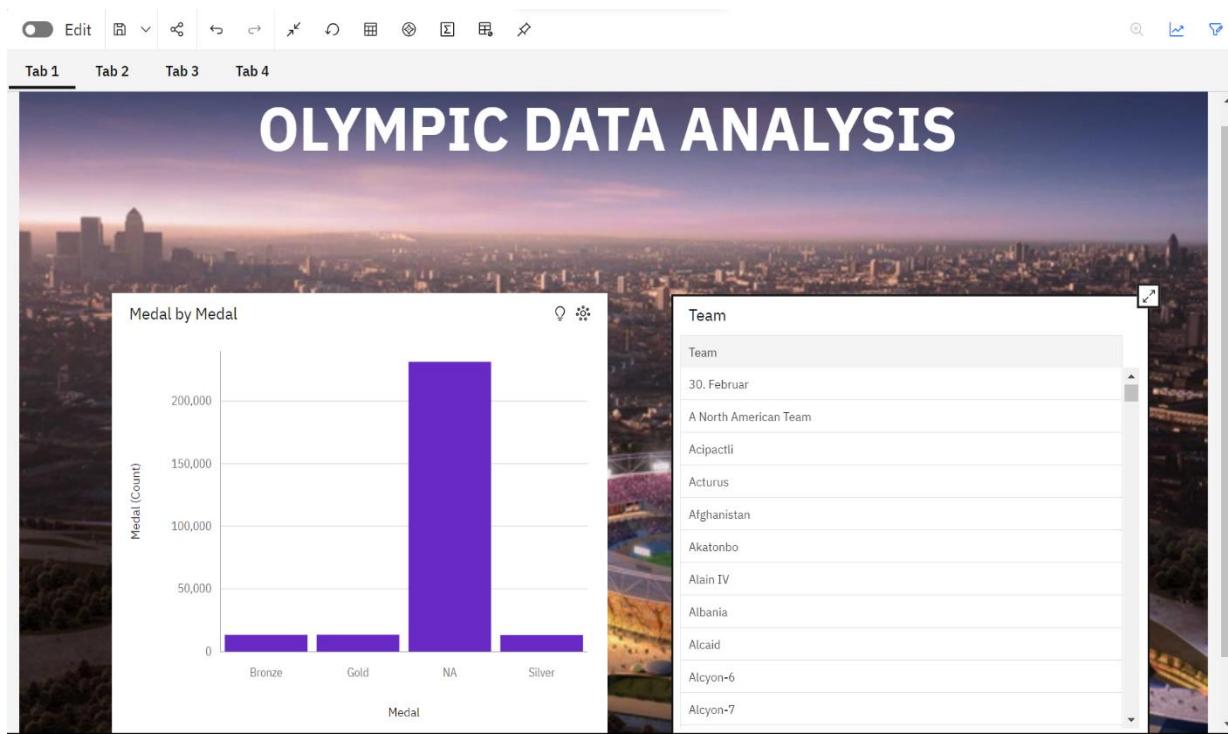
</div>

</footer><!-- End Footer -->
```

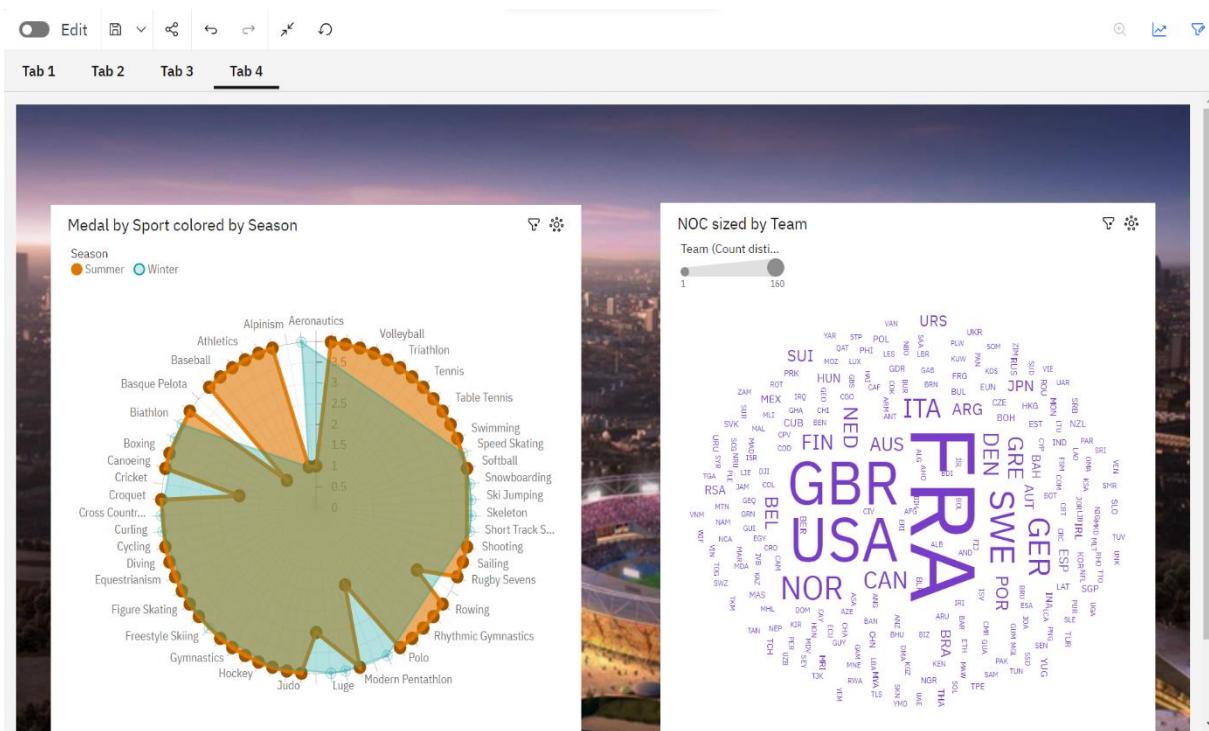
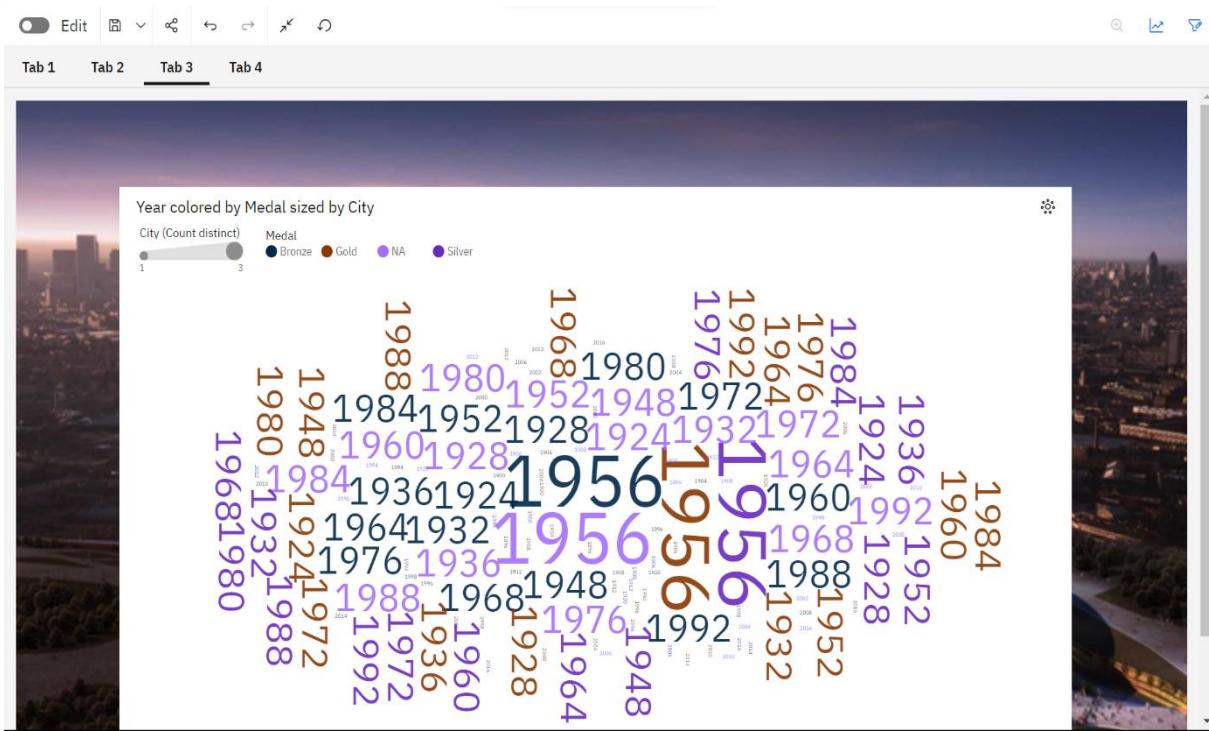
```
<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i  
class="bi bi-arrow-up-short"></i></a>  
  
<!-- Vendor JS Files -->  
  
<script src="/static/assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>  
  
<script src="/static/assets/vendor/glightbox/js/glightbox.min.js"></script>  
  
<script src="/static/assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>  
  
<script src="/static/assets/vendor/swiper/swiper-bundle.min.js"></script>  
  
<script src="/static/assets/vendor/php-email-form/validate.js"></script>  
  
<!-- Template Main JS File -->  
  
<script src="/static/assets/js/main.js"></script>  
  
</body>  
  
</html>
```

A.1 SCREENSHOT

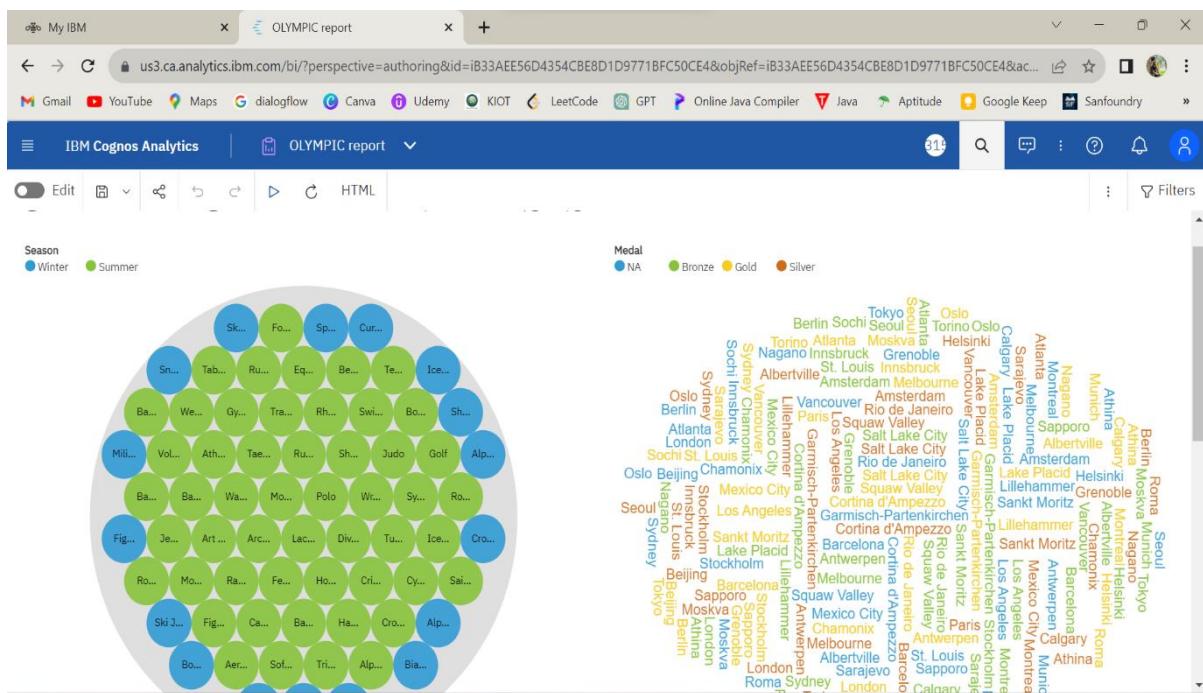
DASHBOARD



Data-Driven Insights On Olympic Sports Participation And Performance



REPORT



STORY

The slide features a large, bold title "OLYMPIC DATA ANALYSIS" at the top left. In the background, there is a photograph of the Olympic Cauldron at night, with three torches forming an X-shape. To the right of the torches, the five Olympic rings are displayed. The background is filled with numerous small lights from spectators. A small video player in the top right corner shows a close-up of the rings.

Prev scene ⏪ ⏴ ⏵ ⏹ ⏺ ⏻ Next scene Scene 1 of 6 0:00.0 0:05.0 ⚙

The slide has a dark blue background with a colorful geometric pattern on the left side. The title "BASED ON NOC BY MEDAL" is prominently displayed in white. Below the title, there is a bulleted list of facts about the distribution of medals by National Olympic Committee (NOC). To the right of the list is a bar chart titled "NOC by Medal" with four horizontal bars of increasing length, colored purple. The x-axis has numerical values 0, 100, 200, and 300.

Prev scene ⏪ ⏴ ⏵ ⏹ ⏺ ⏻ Next scene Scene 2 of 6 0:03.7 0:05.0 ⚙

BASED ON SPORT BY NAME

- From 1932 to 1936, Athletics Name increased by 101%.
- Athletics is the most frequently occurring category of Sport with a count of 38,624 items with Name values (14.2 % of the total).
- The overall number of results for Name is over 271 thousand.

Sport hierarchy colored by Sport and sized by Name

Name (Count dist...)

Sport

- Aeronautics
- Art Competitions
- Basketball
- Bobsleigh
- Croquet
- Diving
- Football
- Alpine Skiing
- Athletics
- Basque Pelota
- Boxing
- Cross Country Skiing
- Equestrianism
- Freestyle Skiing
- Alpinism
- Badminton
- Beach Volleyball
- Canoeing
- Curling
- Fencing
- Golf
- Archery
- Baseball
- Biathlon
- Cricket
- Cycling
- Figure Skating
- Gymnastics

Prev scene | Next scene | Scene 3 of 6 | 0:05.0

BASED ON TEAM AND CITY BY SEX

- City London has the highest Team due to Year 2012.
- Beijing has a Team of 292 for Year 2008.
- Sex M has the highest Team at 5333, out of which City London contributed the most at 334.
- Year 1992 has the highest Team at 323, out of which City Barcelona contributed the most at 212.
- London is the most frequently occurring category of City with a count of 22,426 items with Team

Team by City colored by Sex

Sex

- F
- M

Prev scene | Next scene | Scene 4 of 6 | 0:05.0

BASED ON CITY BY MEDAL

- In this we can see that the medals which city get and it shown by color.
- The green color represent the bronze medal.
- The blue color represent the gold medal.
- The orange color represent the silver medal.
- Most of the city colored in pink it represent the no medal.

City colored by Medal

Medal

- Bronze
- Gold
- NA
- Silver

Prev scene | Next scene | Scene 5 of 6 | 0:05.0

BASED ON WEIGHT BY SPORT

- Sex M has the highest Weight at 2844, out of which Sport Weightlifting contributed the most at 166.
- From 2000 to 2002, M's Weight dropped by 49%.
- Add insight to favorites
- From 1956 to 1960, Wrestling's Weight increased by 94%.
- Add insight to favorites
- Sport Weightlifting Weight from Sex M is 166, whereas Athletics is only 142.

Weight by Sport colored by Sex

Sex

- F
- M

Sport	Sex M (Weight)	Sex F (Weight)
Aeronautics	~45	~40
Alpinism	~55	~50
Art Competitions	~20	~20
Badminton	~145	~65
Beach Volleyball	~75	~65
Billiards	~35	~30
Canoing	~95	~45
Croquet	~45	~40
Curling	~45	~40
Diving	~65	~55
Fencing	~65	~55
Football	~65	~55
Golf	~65	~55
Handball	~65	~55
Ice Hockey	~85	~65
Judo	~110	~45
Luge	~45	~40
Modern Pentathlon	~45	~40
Nordic Combined	~45	~40
Racquets	~40	~40
Rugby	~65	~55
Sailing	~85	~65
Speed Skating	~85	~65
Ski Jumping	~85	~65
Softball	~65	~55
Swimming	~75	~55
Table Tennis	~65	~55
Tennis	~65	~55
Triathlon	~65	~55
Volleyball	~65	~55
Weightlifting	~166	~142

Prev scene | Next scene | Scene 6 of 6 | 0:05.0

A.2 GitHub & Project Video Demo Link

A.2.1 DEMO LINK -

https://drive.google.com/file/d/1n74pRRl2HYE2T_ZHwTeDTSyyhQmRNwhp/view?usp=drivesdk

A.2.2 GITHUBLINK –

https://github.com/MuraliDev770/NaanMudhalvan_DataAnalytics_NM2023
TMID02031.git